

with angina pectoris, occasionally the pulse rate does not rise proportionately to pulse pressure. Even in unstable individuals, *i. e.*, adolescents and patients showing effort syndrome, it is rare that a marked disproportion is encountered even though both pulse and blood pressure responses are exaggerated and remain abnormally elevated.

490 Post Street.

JOHN J. SAMPSON,
San Francisco.

CARDIAC MURMURS

The stethoscope is of little clinical value unless the physician understands the significance of the sounds he hears. When the auscultatory method is properly applied to the circulatory system, the ability to diagnose certain functional disturbances is greatly enhanced, and the nature of lesions predicated. Fortified by this evidence, prognosis and treatment may be more rationally directed.

Cardiac murmurs may arise from several sources; some external to the heart, but all associated in some manner with its contraction. In growing children and young adults, faults in stream-lining of the heart and great vessels are probably responsible for most of the so-called functional murmurs. They are usually systolic in time and localized. Cardiorespiratory murmurs are also common at this age and have no clinical significance. Pericardial or pleuropericardial friction sounds are also differentiated from murmurs of valvular origin.

Murmurs arising in conjunction with valvular defects are important. Their location in the chest, direction of transmission, intensity, pitch and time in the cardiac cycle determine their point of origin. The effects of exercise and change in posture may aid in interpretation.

In studying the propagation of cardiac murmurs, it is well to remember that they travel on or with the blood current in somewhat the same fashion as audible sound travels on the wind. It is easier to whistle down the wind than up the wind.

Variations from the normal cardiac sounds and murmurs in the periphery will be taken up at another time.

Systolic murmurs at the base tend to be rough; if from the aortic valve, to be transmitted upward along the course of the larger branches of the aorta, and if from the pulmonic valve, to be transmitted more readily toward the left clavicle. They are frequently accompanied by a systolic thrill. If the aortic valve is more than slightly stenosed, the pulse is of the plateau type. A subject with a dilated aorta or dilated arteries arising from the arch may present a systolic murmur and thrill over the upper sternum and vessels at the root of the neck. This must be differentiated from aortic stenosis.

Aortic diastolic murmurs are usually soft, tend to replace the second aortic sound and are transmitted toward the apex, often fading over the mid-cardiac region where the right ventricle overlies the left ventricle, and becoming more audible

again at the apex. A mid-diastolic rumble accompanied by a thrill at the apex may be noted in a few cases, and in a considerable number of cases a presystolic murmur (the Austin Flint murmur) and thrill will be observed at the apex. (The driving character of the aortic diastolic murmur is notable.)

Pulmonary diastolic murmurs (Graham Steele type) are usually of brief duration, localized to the second and third left interspaces close to the sternum. They are usually associated with right cardiac failure and are, therefore, generally transient. We have described a new murmur, presystolic in time, heard best at the tricuspid region in pulmonary insufficiency, and probably having the same mechanism as the Austin Flint murmur in aortic insufficiency. This murmur is also heard in right-sided failure and is transient.

Mitral systolic murmurs are heard best at the apex and are transmitted to the left and back. They are high-pitched and blowing in character. The harsh rasping systolic murmur at the apex in cardiosclerosis is most frequently associated with hypertrophy and dilatation of the heart, and sclerosis of the mitral valve. Exercise generally increases the intensity of the murmurs of mitral insufficiency.

Mitral diastolic murmurs may be early, middle, or late (presystolic). The auricular or presystolic murmur disappears with the onset of auricular fibrillation in the absence of aortic insufficiency. In rapid hearts the various phases of the murmur cannot be accurately recognized as the rumbling presystolic crescendo and loud first sound predominate, especially after exercise.

Tricuspid systolic murmurs are almost the rule in congestive heart failure. They are heard best over a small area at the lower sternum, just to the left of the lower sternum or in the epigastrium. They are of brief duration, "close to the ear," and often have an amphoric quality. With organic tricuspid valvulitis the murmur may be very harsh, and accompanied by a thrill.

Tricuspid diastolic murmurs are relatively uncommon and are usually associated with tricuspid stenosis. They may be early or late in diastole (presystolic). The presystolic phase disappears with the onset of auricular fibrillation.

University of California Hospital.

WILLIAM J. KERR,
San Francisco.

CHRONIC VITAMIN D TOXICITY

A warning against the possibility of acute or chronic poisoning from excessive administration of vitamin D preparations was recently made in these columns.¹ It was pointed out that there is as yet no evidence to indicate what the chronic toxicity of vitamin D preparations may be, especially if contaminated with "toxisterol." This poisonous ingredient, which may be present in any irradiated ergosterol product if the irradiation is

¹ Leake, C. D.: *Calif. and West. Med.*, 44:149 (March), 1936.

not carefully controlled, is a powerful calcifying agent, but has no significant antirachitic properties.² Long-continued administration of relatively small amounts of vitamin D preparations, contaminated with "toxisterol," may lead to abnormal calcifications, whose presence may not be suspected for many years. It is doubtful that "calciferol," the most satisfactory irradiated ergosterol, is identical with natural vitamin D.² But there is evidence to indicate that excessive administration even of natural vitamin D products (including cod-liver oil) may promote cardiac disturbances or vascular abnormalities.³

Another more serious possibility concerning too extended or intensive use of vitamin D or irradiated ergosterol preparations has arisen as a result of the brilliant chemical work of the past six years on phenanthrene derivatives.⁴ The most complex substances in this series are the sterols, which, by progressive dehydrogenation, may be converted into bile acids or sex hormones. The most potent carcinogenic agent known is methylcholanthrene,⁴ which can readily be formed from bile acids by reactions of the type known to occur in the body. Fieser conservatively states that "while proof is entirely lacking, it appears possible that many forms of cancer may originate in the metabolic production of methylcholanthrene or related substances from the bile acids, or perhaps from the sterols or sex hormones, of the body."⁴

If such a possibility exists, there is further reason to urge caution in using, or advising for use, indiscriminate amounts of vitamin D or irradiated ergosterol products in excess of what the body needs, or can synthesize itself if there is sunlight available. It is important to remember that the experiment has not yet been made. We do not know whether or not the spontaneous cancer incidence in mammals given large amounts of vitamin D in infancy and adolescence would be any greater than in a series not so treated. But in humans it is wise, if the possibility exists, not to take the chance.

Naturally this is not an argument for interfering with the effective treatment or prevention of rickets by vitamin D. But it is a plea to use some discretion in the amounts of vitamin D prescribed. Commercial enterprise is endeavoring to capitalize to the fullest in the current popular vogue for vitamin D. In addition to a sun-tan craze, there are ballyhooed everywhere irradiated foodstuffs of all varieties, metabolized milks, and even "sunshine soaps." It is ridiculous. But when, on top of an unknown but probably quite adequate intake of vitamin D, especially in sunny California, children are dosed with large amounts of vitamin D preparations by overanxious mothers, it is time for physicians to use care in prescribing the drug. As in every phase of chemical use in medicine, physicians should carefully weigh the risk of using the chemical against the hazard of

the disease. And the public should realize that vitamin D is a drug, that its administration should be guided by a physician, even in connection with metabolized or irradiated milk, and that commercial efforts to promote its indiscriminate use are ballyhoo for gain without due regard for public welfare.

Concerning this matter the Director of Public Health of San Francisco, Dr. J. C. Geiger, has issued a proper warning:⁵ "The Director of Public Health wishes to record the fact that he disapproves the present tendency of manufacturers to add measured quantities of vitamins to foods for commercial purposes. The insufficient and incomplete scientific knowledge available at this time on the possible effects of the consumption of vitamin-reinforced food products over indefinite periods of time fully justifies the attention that caution should be observed in the use of such products. There is still considerable question, particularly in the instance of vitamin D, of what constitutes the proper dosage of vitamin concentrates in the various age groups. Any attempt to increase the sale of a food product, especially milk, by the addition of a substance whose value to the public health is still a controversial problem is indeed ill advised, since the final evidence, to be determined by research methods, has not yet been secured. Even if it is granted that the actual danger in the consumption of vitamin D milk is relatively minimal, there is as yet no definite and accepted information on the limits or margins of clinical safety. Under these circumstances, therefore, it is believed that the administration of such products should be surely in the province of the physician, and not in that of the commercial distributor or manufacturer of food products."

Pharmacological Laboratory,
University of California Medical School.

CHAUNCEY D. LEAKE, Ph.D.,
San Francisco.

⁵ Geiger, J. C.: California State Department of Health, Weekly Bull., 15:98 (July 18), 1936.

Protective Foods.—Protective foods should be included in the menu of every man. These foods are particularly rich in vitamins, and you need vitamins to remain in health. The protective foods include leafy vegetables, fruits, and milk. Medical and scientific studies have demonstrated that their use aids in warding off disease, and so helps to increase the life span.

Leafy vegetables include lettuce, romaine, spinach, kale, cabbage, cauliflower, dandelion greens, turnip and beet tops, celery, and endive. Besides these, although not leafy vegetables, string beans and tomatoes are rich in protective substances. Every full meal should include two cooked vegetables as well as a vegetable salad, the latter preferably of raw vegetables, such as lettuce, tomatoes, celery, and carrots.

Oranges, grapefruit and lemon, in other words, the citrus fruits; bananas, apples, apricots, grapes, plums, pears, canteloupes, figs, pomegranates, are rich in vitamins, especially vitamin C, and should be eaten freely.

Every man should drink at least a pint of milk every day, for milk is the most nearly perfect food known. Dairy products, cheese and butter, also are fine for health. Both milk and cheese are rich in calcium, a mineral which the body must have.—Dr. John L. Rice, Commissioner of Health, New York City.

² Bills, C. E.: *Physiol. Rev.*, 15:1 (Jan.), 1935.

³ Herlitz, C. S.: *Acta. Paediat.*, 8:443, 1931; Wahlin, B.: *Acta. Med. Scand.*, 74:430, 1931; Thatcher, L.: *Lancet*, 230:20 (Jan. 4), 1936.

⁴ Fieser, L. F.: *The Chemistry of Natural Products Related to Phenanthrene*, New York, 1936.